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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/155,921	05/13/99	DONN G	514413-3669

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WILLIAM F LAWRENCE
FROMMER LAWRENCE & HAUG
745 FIFTH AVENUE
NEW YORK NY 10151

EXAMINER	
BRUNOVSKIS,P	
ART UNIT	**PAPER NUMBER**
1632	10

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No. 09/155,921	Applicant(s) Donn et al.
	Examiner Peter Brunovskis	Group Art Unit 1632

☒ Responsive to communication(s) filed on *May 11, 2000*

☒ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire *3* month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claim

☒ Claim(s) *9 and 11-16* is/are pending in the applicat

Of the above, claim(s) _____ is/are withdrawn from consideration

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) *9 and 11-16* is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☒ All ☐ Some* ☒ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☒ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

DETAILED ACTION

The response filed 11/09/00 has been entered. Cancellation of claim 10 and amendment of claims 9, 11, 12, 15, and 16 is acknowledged. Claims 9 and 11-16 are pending in the instant application. Applicant's arguments filed 11/09/00 will only be considered to the extent that they apply to the pending claims; arguments directed to any other subject matter is considered moot.

Claim Objections

Claim 9, 11, and 13 are objected to because of the following informalities: Claim 9 is not punctuated properly. First, the period at the end of "a)" should be replaced with a semicolon. Also, "b)" and "d)" should be deleted, since these are not method steps, but rather serve to qualify the method steps recited in "a)" and "c)". Therefore, "c)" should be changed to --b)-- and "e)" should be changed to --c)--. Additionally, "and" at the end of part b) (as currently recited) should be replaced with a semicolon. Also in claim 9, "chloroplastic GS" should be changed to --chloroplastic glutamine synthetase (GS)--. In claims 11 and 13 "and/or" should be changed to --or--. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 9 and 11 are rejected and claim 12 remains rejected under 35 U.S.C. 112, second paragraph, for the reasons of record set forth in the Office Action of 5/11/00 as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9 is indefinite in its recitation of "chloroplastic GS-antisense RNA" in step c) because it is unclear whether "chloroplastic" is directed to the "GS" only, the "antisense RNA", or both. In other words, it is unclear whether step c) involves transfer and integration into chloroplast DNA, whether the antisense RNA is "chloroplastic", or whether the GS protein product is chloroplastic, but expresses an antisense RNA in the cytoplasm.

Claim 11 recites the limitation "the imported asparagine synthetase" in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claim 12 remains rejected in its recitation of "propagation material" since it is unclear how this term is defined or what its metes and bounds are. Applicant's arguments filed 11/09/00 have been fully considered but they are not persuasive. The response refers to the specification at page 7, lines 9-10, which recites that "...seeds, propagule or propagation material of the foregoing methods are contained in the foregoing cells" and asserts that the "foregoing methods" as well as the "foregoing cells" make clear that Applicants' recitation of "propagation material" means the transgenic plant material--not non-living material. This contention is not persuasive since the lines 9-10 recite "a plant, seeds, propagule or propagation material, *from the foregoing methods,*

or containing the foregoing cells (emphasis added); the definition recited therein is not explicitly limited to propagation material from transgenic plants *per se*, but rather methods and cells comprised of such material. The last sentence in p. 7 of the specification states that "the invention comprehends *a plant cell transformed with the gene construct or vector*, as well as plants, seeds, and propagules or propagation materials *containing such cells* (emphasis added). Again, there is nothing here tying propagation materials to transgenic plants, but rather to plant cell[s] transformed with the gene construct or vector or propagation materials containing such cells. Absent evidence to the contrary, the specification does not provide a clear definition of "propagation material", nor describe its metes and bounds. When read in light in light of the specification, a reasonable interpretation of "propagation material" appears to include any composition derived from or used in a method used for making transgenic plant material (e.g. plant cuttings, MS agar, potting soil). Therefore, it is unclear what is included or excluded from the claimed subject matter.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 9 and 11-16 are rejected or remain rejected under 35 U.S.C. 103(a) for the reasons of record set forth in the Office Action of 5/11/00 as being unpatentable over Coruzzi et al. (AG) in view of Dudits et al. (AH), Temple et al. (AP), and Della-Cioppa et al.

Applicant's arguments filed 11/09/00 have been fully considered but they are not persuasive. Applicants contend that it is impermissible within the framework of 103 to pick and choose from any one reference only so much as it will support a given position to the exclusion of other parts necessary to the full appreciation of what such a reference fairly suggests to one of ordinary skill in the art, that none of the references cited, either alone or in any fair combination, serve to obviate the instant invention, and that a proper reading of the references would lead one of skill away from the instant invention.

With regard to the first point, Applicants assert that the teachings of Coruzzi (p. 22, lines 16-19) concerning antisense constructs which inhibit production of glutamine synthetase must be read in connection with previous sentence describing multiple GS isozymes potentially requiring suppression of endogenous genes (p. 6 of response), and contend that "[a]pplicants have explained in the application (see examples 4 and 5 of the instant specification) that the only GS to be inhibited is chloroplast GS (GS2), because only the chloroplastic GS-coding sequence was cloned in the antisense direction" (response, top of p. 7). Applicants further argue that their objective is completely different from Coruzzi's intent to inhibit all GS genes and that is not obvious for a skilled artisan to reduce the knockout-recommendation of Coruzzi (knockout of all GS genes in a plant) to the selected knockout of only a certain species of GS gene (i.e. the

chloroplastic GS genes) as taught in the present invention. In response to these arguments, a few observations must be noted. First, there is no suggestion from the specification, at the time the invention was made, that Applicants selectively contemplated or taught antisense inhibition of only chloroplastic GS isoenzymes as suggested. For example, the open language in the instant claims does not limit the antisense constructs recited in the instant claims to only chloroplastic GS isoenzymes as suggested, but rather establishes the minimum requirement that they at least contain one chloroplastic GS isozyme. Moreover, despite multiple references explicitly teaching nucleic acids modified to target asparagine synthetase to the chloroplasts, except for the specific embodiments described in the working examples, *all other references to glutamine synthetase are generic in nature* (e.g. middle of p. 4; sentence abridging p. 4-5; middle of p. 5; top of p. 8, sentence abridging p. 9-10). Further, Applicants repeated statements or suggestions that Coruzzi's teachings are limited to reducing all GS isoenzymes is not valid. The sentence referred by Applicants on p. 22, lines 14-16, merely stated that "[i]n plant species that encode multiple GS isozymes, this *may* require the suppression of the endogenous GS isozymes" (emphasis added). Importantly, Coruzzi teaches that "where suppression of most, if not all, GS isozymes is desired, it is preferred that the co-suppression construct encodes a complete or partial copy of chloroplastic GS mRNA (e.g., pea GS2 mRNA). As disclosed herein (section 6.2.2.), such constructs are particularly effective in suppressing the expression of the target gene" (p. 29, lines 26-32). Section 6.2.2. discloses transgenic plants engineered to suppress chloroplastic GS2 activity using antisense GS2 constructs (p. 45-49); furthermore, claim 12 (p. 85) explicitly recites

a method of producing a plant with a suppressed level of chloroplastic glutamine synthetase. Taken together, when compared with the teachings of the instant specification, the teachings of Coruzzi provide an equally, *if not more* compelling and thoughtful case for engineering transgenic plants expressing antisense RNAs of chloroplastic glutamine synthetase genes.

Applicants further argue that Temple actually demonstrates that one of skill did not understand how to control selectively the GS1 and GS2 genes via an antisense approach, further arguing that Temple was not able to selectively knockout GS1 and that plants transformed with the antisense GS1 construct showed a significant decrease in the level of both GS1 and GS2 polypeptides and activity, but did not show any significant decrease in the level of endogenous GS mRNA. Essentially the same argument was used against the teachings of Dudits (bottom paragraph, p. 8). In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., selective knockout of GS1 or GS2 [at the mRNA level]) are not recited in the rejected claim(s). It is irrelevant whether selective suppression of GS activity was achieved, independent of whether this was at the mRNA or protein levels. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). This argument similarly applies to Applicants arguments directed to Della-Cioppa in relation to Applicants teachings concerning combining an "optimum transit peptide" described in the prior art for use in the instant invention.

One of the central reasons for incorporating Temple in the obviousness rejection was to draw attention to Temple's teachings that the chloroplast GS (i.e. GS2) reassimilates ammonia produced by photorespiration wherein GS2 constitutes the overwhelming GS form found in leaf tissues. In view of their demonstration of reduced GS2 activity in leaf tissue by expression of an antisense GS1 construct, Temple clearly provides a motivation, a basis, and an expectation of success for producing transgenic plants engineered with antisense GS2 expression constructs. Applicants correctly argue that it is well-established that "there must be some reason for the combination other than the hindsight gleaned from the invention itself" (p. 9). In response to this argument, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). Further, in response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). Furthermore, instead of addressing the specific grounds for obviousness establishing a

motivation for combining the cited references and an expectation of success as set forth in the Office Action of 5/11/00 (e.g. as in the paragraph abridging p. 3-4), the arguments set forth in the response filed 11/09/00 instead appear to argue nonobviousness by attacking references individually where the rejections are based on combinations of references , which is improper [See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986)].

Applicants have further argued that "even if a prima facie case of obviousness were established...Applicants have provided evidence of surprising and unobvious results...Example 8...[and have] asserted that the claimed invention and its unexpected and surprising advantages are not taught or suggested by the cited references, either individually or in any fair combination" (p 10). This argument is not persuasive, for the following reasons. First, examination of Example 8 does not clarify what "surprising and unobvious results" Applicants are referring to. Secondly, extrapolation of the results described in the working example are not commensurate with the claimed subject matter. Third, the specification does not clearly describe any unexpected or surprising advantages that are not taught or suggested by the cited references. Taken together, Applicants have failed in their burden to overcome the prima facie case for obviousness as applied to the instant claims and have failed to establish a convincing case for an unexpected benefit or unobvious results over the expectations or teachings in the prior art made of record.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

No claims are allowed.

Certain papers related to this application may be submitted to Art Unit 1632 by facsimile transmission. The FAX number is (703) 308-4242 or 305-3014. The faxing of such papers must conform with the notices published in the Official Gazette, 1156 OG 61 (November 16, 1993) and 1157 OG 94 (December 28, 1993) (see 37 CFR 1.6(d)). NOTE: If applicant *does* submit a paper by FAX, the original copy should be retained by applicant or applicant's representative. NO DUPLICATE COPIES SHOULD BE SUBMITTED, so as to avoid the processing of duplicate papers in the Office.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter Brunovskis whose telephone number is (703) 305-2471. The examiner can normally be reached on Monday through Friday from 8:30 AM to 5 PM. If attempts to reach

the examiner by telephone are unsuccessful, the examiner's supervisor, Karen Hauda can be reached at (703) 305-6608.

Any inquiry of a general nature or relating to the status of this application should be directed to the Patent Analyst, Patsy Zimmerman whose telephone number is (703) 308-8338.

Peter Brunovskis, Ph.D.
Patent Examiner
Art Unit 1632

Scott D. Priebe

SCOTT D. PRIEBE, PH.D
PRIMARY EXAMINER